two errors tend to compensate each other, though probably not entirely.

I do not propose to touch on the estimation of the small amounts of other bodies that have been described in milk, as I feel that our knowledge is not far enough advanced to permit of this, and in presenting this paper to the Congress I can only say that it is very incomplete and is to be considered more as a nucleus for discussion, and, I hope, concerted investigation than an exhaustive resumé of the subject.

In conclusion, I think that the methods that I have touched upon for the estimation of total solids and water, fat, ash, milk sugar, casein, albumen, and total proteids are not liable to any great error, and further that we are enabled to detect watering of milk with fair exactitude. The detection of fat abstraction is not so satisfactory.

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## PATENTS OF INTEREST TO CHEMISTS.

EDITED BY ALBERT H. WELLES.

*Ore Separators, Etc.*—504,665, September 5, Bradford, H., ore separating machine. 505,169,-505,412, September 19, McGlew, T., ore concentrator. 504,931, September 12, Monell, I. F., ore separator and concentrator. 504,923, September 12, Humphries, D. W., concentrator. 504,678, September 5, Fuller, W. M., amalgamator. 504,859, September 12, Boss, M. P., amalgamating pan. 504,508, September 5, Wiswell, J. C., amalgamating machine. 504,689, September 5, Albrecht, H. S., disintegrator for ores, etc. 504,548, September 5, Bauer, T., and Mendheim, G., coke-oven. 505,112, September 19, Ludwig, O., smelting furnace. 505,538, September 26, Sheedy, D., and Iles, M. W., blast furnace. 505,549, September 26, Iles, M. W., tuyere. 505,551, 505,552, September 26, Iles, M. W., process of and apparatus for treating slag. 504,666, September 5, Bradford H., process of concentrating ores by gravity, on a shallow basin over which water flows, the table being jarred to facilitate separation.

*Gold and Silver.*—504,706, September 12, Calhoun, H., extraction of metal from ores; roasting in presence of carbon and ammonium chloride.

*Iron and Steel.*—505,132, September 19, Sague, S. A., manufacture of sheet iron or steel, apparatus for. 505,131, September 19, Sague, S. A., galvanizing sheet metal. 504,322, September 5, Brustlein, H. A., mold for casting ingots. 505,728, September 26, Shaw, A. J., soaking pit for ingots.

*Zinc.*—505,408, September 19, Moore, G. E., willemite and franklinite, in limestone gangue, are calcined in non-reducing atmosphere, the lime

is allowed to slake, the zinc ore is separated from manganese and iron ore, which latter is smelted in the blast furnace for spiegel, while zinc is extracted from the zinc ore.

*Aluminum.*—504,324,-504,325, September 5, Case, W. E., manufacture of aluminum fluo-sulphate free from iron.

*Ammonia.*—505,427, September 19, Vail, G. L., and Charlton, T., purification of ammonia gas; by passing gas under pressure of 9-12 atmospheres through saturated aqua ammonia, at a temperature low enough to condense moisture and impurities.

*Brewing, Etc.*—504,478, September 5, Meyer, G. J., malting apparatus. 505,239,-505,240, September 19, Theurer, J. P., apparatus for charging liquids with carbon dioxide.

*Water.*—505,641, September 26, Rochlitz, W., water distilling apparatus.

*Alkaline Phosphate.*—504,453, September 5, Meyer, T., sulphate of an alkali is treated with phosphoric acid in presence of limestone at a low temperature.

*Sewage Purification.*—505,182, September 19, Adeney, W. E., and Parry, W., after separating the solid matter, sodium manganate is added and the manganese is recovered and converted into manganate again.

*Organic Compounds.*—505,113, September 19, Majert, W., and Schmid, A., piperazin hydrate; having formula $C_4H_{16}N_2+(1+6)H_2O$, a strong solvent of uric acid and without caustic properties. 504,905, September 12, Borgmeyer, C. L., pyroxylin solvent and its compound; the solvent named is artificial oil of peppermint in amyl alcohol, and the compound is pyroxylin dissolved in artificial oils of tansy, peppermint, red thyme, and sassafras. 505,755, September 26, Drewson, V. B., recovery of organic substances from sulphite liquors; by treating with milk of lime at 100° Celsius and under pressure. 505,395, September 19, Engle, J. P., apparatus for treating waste products of petroleum. 505,416, September 19, Bell, A. F. L., process of extracting and refining asphaltum. 504,626, September 5, Schmid, J., medicinal compound; $C_6H_{4\cdot OC_2H_5}^{\cdot N=CC_6H_4OH}$ melting point 90°-91° C. soluble in ether, benzene, or hot alcohol.

*Dyeing.*—505,088, September 19, Bracewell, J., process of fixing colors upon cottons.

*Glue.*—505,615, September 26, Tessen, E., elastic glue or gelatine; made by heating and saponifying with caustic potash and then adding dry magnesium chloride and potash soap. 505,618, September 26, Vogel, B. W., glue for card board; a paste of starch with iodine in solution admixed.

*Plasters and Cement.*—505,747, September 26, Breinig, G. M., artificial stone; crushed quartz, ground calcined quartz, and hydraulic cement are used. 504,933, September 12, Moore, E. A., composition for architectural purposes; consisting of sand, raw gypsum, calcined gypsum, quick lime, glue, sulphuric acid, and kerosene oil. 505,082, September 19, VonAinbach, F. F., artificial stone; composed of powdered and burnt magnesite and a solution of tungstate of soda. 504,477, September 5, LeFevre, C. F.,

cement; borax, twenty-five per cent.; rosin, twenty-five per cent.; glue, fifty per cent., are the ingredients named.

*Miscellaneous.*—505,303, September 19, Withers, S., marbleizing metal, china, etc. 505,576, September 26, Scharling, J. H., depositing layers of metal on glass. 505,520, September 26, Guttman, O., apparatus for concentrating liquids. 505,141, September 19, Tausk, B., process of treating feather fur. 504,774, September 12, Craney, T., electrolytic cell. 505,125, September 19, Pollak, C., electrodes; made from pulverized lead carbonate with caustic soda, or potash added to form a paste. 504,584, September 5, Hunt, A. E., refractory brick; which consists of bauxite bonded with a little lime. 504,388, September 5, Johnson, A., grinding emery wheel; emery, shellac, and salt are incorporated together. 504,724, September 12, Greiner, A. J., composition for preserving food; "charcoal, sulphur, sugar, corn starch, beeswax, saltpeter, cayenne pepper, and ginger." 505,137, September 19, Stebbins, J. H., Jr., process of treating butter. 505,311, September 19, Grindle, P. S., composition for kindling fire; 3 parts sawdust, with 1 part rosin, to which is added $\frac{1}{10}$ part of combustible cement containing $2\frac{1}{2}$ parts coal tar, $1\frac{1}{2}$ asphaltum, $\frac{1}{2}$ part glue, and 1 of starch. 504,988, September 12, Mellinger, J., artificial wood; lime is mixed with a fibrous material and this is treated with a solution of borax, alum, potassium carbonate, zinc sulphate, sodium chloride, and bicarbonate and silicate and lye, molded and subjected to pressure. 504,898, September 12, Weidig, H. P., apparatus for extinguishing fires; liquid carbon dioxide, into which is injected ammonia, is used for the solution. 504,772, September 12, Arnold, E. and R., composition for lithographic stone; "potassium binoxalate, pumice stone, alum, magnesium chloride, strong sulphuric ether, and water." 505,426, September 19, Steiner, S. W., non-conducting composition for steam pipes; "vegetable, animal, or mineral fiber, and hydrate of lime." 505,531, September 26, McCook, E. M., composition for roofing; "coal tar pitch, anthracene oil, geyserite, and sand, or gravel."

*Ore Separators, Etc.*—506,976, October 17, Campbell, A. C., ore separator. 506,035, October 3, Darragh, F. D., ore concentrator. 506,591, October 10, Guild, G., phosphate separator. 507,465, October 24, Vale, S. W., amalgamating machine. 505,609, October 10, Seymour, C. E., ore concentrator. 506,751, October 17, Wall, E. A., ore jigger. 507,350, October 24, Bohm, W. D., apparatus for leaching ores. 507,204, October 24, Bird, E. J., limestone, or metallurgical furnace. 507,460, October 24, Simonds, G. F., metallurgical furnace. 507,031, October 17, Nesmith, J. W., blast furnace. 507,411, October 24, Briggs, J., kiln for burning limestone. 505,904, October 3, Neill, J. W., separating molten metal by electro-magnets. 506,129, October 3, Pearce, R., regulating blast in ore-roasting furnace.

*Iron and Steel.*—506,689, October 17, Harvey, H. A., steel rail, containing varying proportions of carbon in different parts. 506,518, October 10, Leibert, O. F., apparatus for casting steel or other ingots. 506,799,

October 17, Sentinella, R. L., metallic flux for refining iron and steel for casting; iron, sodium, sodium chloride and iron chloride are heated in a crucible to a semi-fluid condition, when sodium chloride is added and the heat is increased. **507,082,** October 17, Randnitz, S., protecting iron from rust, by immersing in acid bath containing metallic oxide, then dipping in a hydrocarbon.

*Nickel.*—**505,846,** October 3, Ricketts, P de P., separation in nickel bearing bodies by immersing in sulphuric acid, adding alkaline sulphates and electrolyzing.

*Copper.*—**506,985,** October 17, Douglass, J., separation from copper matte, by injecting sulphurous acid in solution containing ferrous chloride in which matte is suspended, recovering insoluble subchloride of copper by chloride of iron, and precipitating silver in matte by copper and copper by iron. **506,965,** October 17, Baswitz, C., removing copper from textile fabrics; after dipping them in a solution of vegetable parchment in ammoniacal oxide of copper, and evaporating the ammonia, they are treated with ammonium sulphate and aluminum acetate solution to remove the copper and render the fabrics uninflammable. **507,130,** October 24, Hoepfner, C., electrolytic separation of metals; cuprous chloride solution is formed and electrolyzed.

*Aluminum.*—**507,822,** October 31, Lancon, M. H., solder; aluminum, 95 per cent.; copper, 1 per cent.; tin, 4 per cent. **505,864,** October 3, Wegner, G. and Gührs, P., coating aluminum and alloys, with a solution of acetous verdigris, oxide of iron, sulphur, and ammonium chloride and heating, finally painting with sulphur dissolved in turpentine and firing, and then steeping in bath of linseed oil and brushing the surface with beeswax.

*Acids and Alkalies.*—**507,895,** October 31, Farmer, J., acetic acid manufacture. **506,029,** October 3, Barrows, J. F., burning limestone. **507,741,** October 21, Luhmann, E., apparatus for carbonic acid. **507,741,** October 31, Luhmann, E., process for carbonic acid manufacture; liquors are heated to expel carbonic acid, and boiled under high pressure in closed boilers to concentrate lye. **506,639,** October 10, Knietsch, R., liquid chlorine; passing confined body of chlorine through heated sulphuric acid in a confined space. **507,039,** October 17, Rossbach, H., condenser for ammonia. **507,331,** October 24, Salomon, F., process for obtaining hydrogen and carbonic acid gas; impregnating carbonaceous material with an alkaline hydrate and passing water vapor through mass, and separating gases. **505,809,** October 3, Bowman, R. D., apparatus for oxygen. **505,895,** October 3, Cutterr, E. B., apparatus for soda and chlorine by electrolysis. **506,640,** October 10, Knietsch, R., package of liquid chlorine-anhydrous. **507,392,** October 24, Tatman, B. F., aerating apparatus for carbonating liquids. **507,753,** October 31, Playfair, D. J., process of making cyanides; a sulphocyanate is heated with a metal, whereby an insoluble sulphide and a cyanide, is formed.

*Sanitary Chemistry.*—507,264, October 24, Eickershoff, J. H., filtering and sterilizing apparatus, 507,774, October 31, Ball, P., apparatus for purifying water. 505,967, October 3, Sprague, A. V. M., sterilizing apparatus. 506,248, October 10, Opperman, G., purifying water by electrolysis, 506,879-880, October 17, Jewell, J. H., apparatus for and method of purifying sewage; the sewage is filtered through combustible filtering medium, and separated solids are ignited with this filter. 507,084, October 17, Trillat, J. A., preserving food, by impregnating with formaldehyde.

*Bleaching and Dyeing.*—507,404, October 24, Bentz, E., *et al.*, apparatus for and process of bleaching; the goods are saturated with the bleaching liquor and steamed, while the air is excluded, 506,918, October 17, Kothe, R., *et al.*, blue triphenylmethane dye. 506,265, October 10, Schmidt, R. E., alizarinhexacyanine dye, yellowish brown. 506,284, October 10, Ulrich, M., and Baumann, J., blue tetrazo dye. 505,663, October 17, Bloede, V. E., dyeing black, violaniline and vegetable yellows, such as fustic, with suitable mordants are used.

*Tanning.*—506,696, October 17, James, J. H., tanning process. 507,213, October 24, Chase, J., artificial leather; from animal material by disintegrating in presence of water and reuniting elements under pressure.

*Explosives.*—507,279, October 24, Leonard, M. E., smokeless powder, nitroglycerol, gun-cotton, lycopodium, a "neutralizer of free acid, such as urea crystals or dinitrobenzol and oil" are the ingredients, 506,784, October 17, Kranz, A., dynamite made from nitroglycerol, camphor, and gun-cotton, with linseed oil and oil of turpentine, treated with ammonium nitrate and sulphuric acid, 506,032, October 3, Blomén, J. E., blasting compound; "granules of an oxidizing agent, covered by films of a mixture of a hydrocarbon and dinitrophenol. 506,031, October 3, Blomén, J. E., a hydrocarbon is treated with nitric acid, then with nitric and sulphuric acid, again with nitric and finally with an oxidizing agent.

*Oils and Varnishes.*—507,586, October 31, Ling, E. E., oil solvent; a compound of sodium, lime, and glycerol. 507,749, October 31, Paget, L., pyroxylin solvent; an ozonized menstruum. 507,964, October 31, Borgmeyer, C. L., and Paget, L., pyroxylin solvent; aceto-acetate of amyl, ozonized fusel oil, wood alcohol, and benzine. 507,230, October 24, Laird, R. H., deodorizing and refining crude oils. 507,441, October 24, Koehler, H., refining petroleum, by passing through heated lime. 507,512, October 24, Victorson, V., method for finishing surface of wood; a varnish rich in an oxidizable oil is used, and the wood is heated to evaporate solvent of varnish and oxidize and harden the oil.

*Plaster and Cement.*—507,745, October 31, Moore, C. M., fire and waterproof paint and cement; "brick-bat clay, hard wood ashes, fine sand, common salt, alum, and linseed oil," form the compound, 507,662, October 31, Ménégal, N. D., non-conducting and water-proof cement; made from white clay, yellow ochre, iron filings, cocoanut fiber, wool, flour, charcoal,

and lubricating oil. **506,870**, October 17, Carey, P., fire proof covering for steam pipes; consists of asbestos fiber, sulphate of lime, soluble glass, water, and Glauber's salt. **506,356**, October 10, Bedbury, G. W., composition for water pipes; contains asphaltum, pulverized clay, magnesia, and asbestos. **506,745**, October 17, Stanley, W. L., adhesive compound for metallic coverings; "coal-tar pitch, gum asphaltum, crude rubber, alum, and whiting." **505,916**, October 3, Hoffman, J., insulating compound; asbestos fiber with a binder of asphaltum, beeswax, and shellac. **507,678**, October 31, Fanning, J. J., insulating compound; contains plaster of Paris, asbestos, dextrin, and linseed oil. **507,942**, October 31, Stafford, B. D., composition for plaster; borax, alum, wheat flour, sugar, and slaked lime are claimed. **506,847**, October 17, Frear, A. H., artificial stone; an aqueous saccharine solution of litharge, an alkaline solution of shellac, an aqueous solution of glue and ochre, hydraulic cement, sand or gravel, gypsum, and a metallic oxide ore combined.

*Miscellaneous.*—**507,473**, October 24, Bazille, J. A., and Partridge, G. W., cleaning compound; of flour, sal-soda, olive oil, blue vitriol, venetian red, and water. **506,493**, October 10, Hall, F., preserving wood; by immersing in a hot solution containing to each cubic foot of water, 1½ lbs. caustic soda or potash, 4 lbs. soda ash, ½ lb. arsenic sulphide, dissolved in sodium sulphide. **506,109**, October 3, Gerland, F. J. M., half-tone negative. **505,985**, October 3, Marfori, P., iron albumen preparation; an iron derivate of albumen, containing ten per cent. of iron soluble in strong tartaric acid, but not in water. **507,969**, October 31, Cleaver, J. B., anti-friction composition; plumbago, silk particles, and a fatty substance are used. **507,970**, October 30, same patentee, particles of hides or skins are used in place of the silk. **505,847**, October 3, Rochow, B., medicinal soap; made from pure tallow soap, white wine, unsaponified olive oil, camphor gum, oil of rosemary, and oil of lavender. **506,004**, October 3, Grünwald, J., soap; magnesium chloride, starch, caustic potash, hydrated lime, and glycerol, are the ingredients. **507,246**, October 24, Spiceker, G., blocks of fuel; finely divided combustible material and resinous pitch. **507,225**,-**507,501**, Jones, W. H. L., and Warr, G. C., softening vegetable fibres; by the action of boiling glycerol, ammonia, oil, and soap. **506,051**, October 3, Langville, L. S., black ash residuum of wood pulp manufacture, treatment of. **505,936**, October 3, Bird, H. J., disintegrating vegetable substances; from the paunches of slaughtered cattle.

## NEW BOOKS.

ANALYSIS OF MILK AND MILK PRODUCTS. BY HENRY LEFFMANN, M.D., PH.D., AND WM. BEAM, M.A., M.D. P. Blakiston, Son & Co. Philadelphia. 1893. 92 pp., 8vo. Price, $1.

This is the best manual upon the subject of the analysis of milk and its products which has as yet appeared in English.